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Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Revision of Part 97 of the Rules	)	
Governing the Amateur Radio	)	**RM-8218**
Services Concerning High-Frequency	)	
Data Communications	)	

To: The Commission

COMMENTS

The American Digital Radio Society
c/o Warren J. Sinsheimer
30 Rockefeller Plaza
New York, NY 10112

May 10, 1993

The American Digital Radio Society ("Society") is a not-for-profit corporation organized and existing under the laws of the State of Delaware. Its members are all radio amateurs licensed by the Federal Communications Commission.

The current petition of the American Radio Relay League ("ARRL") requests that the Commission permit fully automatic control of data emissions in the HF bands in specific sub-bands defined in their petition. On December 12, 1989 the ARRL filed a Petition for Rule Making (RM 7248) which requested, inter alia, amendment of Part 97 to permit fully automatic control of HF data communications. In that petition the ARRL proposed that such automatic operations be limited to specific sub-bands. Opposition to specific sub-bands caused numerous comments to be filed at the time opposing the proposed Rule Making. The main reason for the large number of adverse comments was that the notion of HF sub-bands for fully automatic operations did not permit "real world operation" and experimentation of existing and new digital modes. It was a thoroughly bad idea in 1989. The idea has not mellowed with age. It remains a thoroughly bad idea. However, it may be the only way to allow the continuance of fully automatic packet operation at HF if the Commission decides that such operation should continue.

Why does the Board of the ARRL believe that sub-bands are necessary? The Board knows that fully automatic operations have a tendency to create uncontrolled and uncontrollable interference to others using the same

frequency. A computer which activates a transceiver at HF has no way of knowing whether the frequency is in use by others and consequently interference cannot be avoided. Existing technology does not permit the accurate sampling of a frequency before the commencement of the interfering activity.

As a consequence of this technical difficulty, the ARRL has sought to confine the chaos to specific band segments. They argue, we suppose, that others, having been made aware of the impossibility of using the frequencies set aside for the exclusive use of fully automatic forwarding stations, should seek other frequencies for their communications. In itself, the creation of sub-bands for use by specific activities (as distinguished from modes) violates one of the principle precepts of the Commission that prohibits the exclusive use of specific frequencies by any licensee.

Today, all fully automatic operation is conducted with packet. For a number of years, these operations have been conducted at HF under the provisions of the STA granted by the Commission. To the best of our knowledge, no major technical advances have been made in packet technology as a result of the STA. However, it is interesting to note that all generation, experimentation and operations of newer and more efficient modes have taken place outside the STA.

There is no doubt that if the purpose of the ARRL petition was to set aside sub-bands exclusively for fully automatic digital operations and to effectively exclude all licensees operating other than fully automatic digital

operations in those sub-bands. they have succeeded admirably.

described above as being permitted by the rules. Amateurs also have interpreted these sections to permit a station under local control to receive and retransmit traffic from unattended stations.

The Society will also comment on the Commission's Notice of Rule Making, RM93-85. The Society interprets the modifications to Part 97 proposed in such notice of rule making to continue to authorize semi-automatic operation as herein defined. If this interpretation is incorrect, the Society will urge the Commission to clarify Part 97, §97.109(d); §97.109(e) to remove any doubt that there can be with respect to the continuity of semi-automatic operations. The Society notes that some form of semi-automatic operation has practiced for more than 30 years.

The Society believes that the position taken by the ARRL in the subject petition does NOT reflect the views either of the ARRL's members or its appointed group of experts called the digital committee which made extensive studies of the issue of fully automatic HF operation. In June 1992 it recommended to the Board of the ARRL that unattended semi-automatic digital operation but not fully automatic operation be permitted at HF. A copy of their report is annexed as appendix A. The report, however, was rejected by the Board of the ARRL and the committee was required to revisit the problem in light of the serious objections of STA operators who would have lost their special privileges if the report had been adopted and had become part of the FCC rules. The Society

submits that the Board's action was taken as a result of pressure of the STA operators rather than for sound technological reasons.

The ARRL seems to be completely motivated in this petition by the issue of interference. On the other hand, the Commission is also concerned with the responsibility of operators for the content of messages. (See NPRM 93-85) The Society agrees with the ARRL Digital Committee that the problem of interference with unattended semi-automatic operation can be held to a minimum. The Society also believes that the Commission's initiative (93-85) with respect to content responsibility is an appropriate way of dealing with the problems caused by automatic (or semi-automatic) forwarding.

The Society reiterates that it does not oppose the relegation of fully automatic operations to specific sub-bands. However, if the Commission should decide that sub-bands are not appropriate, then the Society urges the Commission:

(1) not to reinstate the STA as being discriminatory against non STA amateurs;

(2) not to permit any fully automatic digital operations at HF as causing interference with others in an uncontrollable manner and;

(3) to affirm (or rule) that semi-automatic operations as above defined are permissible at all frequencies where digital operations are permissible.

The Society has received copies of a number of letters written to the ARRL and they are annexed hereto and made a part hereof and designated annex B through P.

Respectfully submitted,

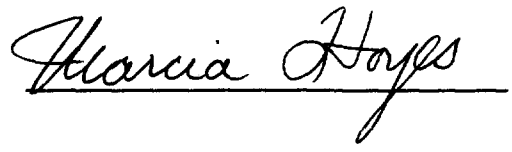
THE AMERICAN DIGITAL RADIO SOCIETY

Warren J. Sinsheimer, President

CERTIFICATE OF SERVICE

I, Marcia Hoyes, do hereby certify that I served a copy of the within comments on the American Radio Relay League by depositing a copy thereof in a post box maintained by the U.S. Postal Service at 30 Rockefeller Plaza, New York, NY 10112. The same was addressed to:

Christopher D. Imlay, General Counsel
Booth, Freret & Imlay
1233 20th Street, N.W.
Suite 204
Washington, D.C. 20036



Dated: May 11, 1993

ANNEX A

ANNEX A

Report and Recommendation to the ARRL Board of Directors

by the

[redacted]

discussed below.

Frequency Usage and Allocations in the U.S. and other Countries

It is no secret that available space is very limited in the h.f. spectrum. Nowhere is that more evident than in the very popular 20 and 40 meter bands. The two oldest modes of operation, voice and c.w., have the lion's share of the spectrum in those bands since they were in heavy use before there were any digital modes. The digital modes have simply "squeezed in the cracks" between already established modes of operation. Since the digital modes have become established they have expanded gradually, a little at a time, primarily into space occupied by c.w. operation. Frequencies near the edges of digital mode operation continue to be shared by both digital and non-digital modes.

Outside of the U.S., depending on the ITU region and the rules adopted by various administrations, digital operation for any given mode may not align with practice in this country and it does not seem possible to establish a sub-band plan that could be universally acceptable. It is simply inevitable that any band segment in the h.f. spectrum is going to be shared among differing modes of operation. This is not a new condition on the h.f. bands and has been accommodated for decades.

Available Spectrum Space in the H.F. Bands

Since all current h.f. band space is actively occupied by one or another mode of operation and since no current class of user is willing to give up space for another, the Committee is operating under the assumption that whatever rules are proposed there will not be a sudden significant change in the way the bands are currently used (at least this Committee is not prepared to make any such recommendation!). The Committee believes that gradual changes will continue to occur but that these changes will be due to natural migration as a larger percentage of amateurs shift to digital from other modes of operation and from one digital mode to another.

The respondents to the survey strongly opposed the allocation of sub-bands by rule. The Committee also believes that any attempt to specify by rule sub-bands for a class of digital operation would soon grow obsolete as patterns of operation change, more digital modes are introduced, and more users shift to digital modes. Instead, the Committee believes that the amateur community will need to adjust itself to continued sharing of the spectrum by various modes and that such sharing should be facilitated through the publication by the ARRL of recommended sub-bands for the various modes and that such recommendations should be revised from time to time as operating patterns change.

The Committee, as a subsequent action, will propose a revised band plan for consideration by the ARRL.

In any case, the h.f. spectrum is severely limited, especially for digital mode operation, and modes of operation that improve spectral efficiency must be strongly encouraged. The Committee will undertake a study proposing, in a subsequent action, voluntary technical standards which can be promoted among amateurs and vendors to significantly improve our current frequency usage.

The State of the Art for Amateur HF Digital Operation

While the current rules allow considerable latitude in what digital modes the amateur community uses, the actual practice is somewhat limited. Current practice includes "RTTY", a non-error-protected simplex mode, usually using the baudot code; "AMTOR", a partially error-protected half-duplex mode using the baudot code; "packet", an error-protected half-duplex mode using ascii code; and "PACTOR", an error-protected half-duplex mode using ascii code. In addition, a new DSP-based system has been demonstrated but is not yet generally available called "Clover" that is an error-protected full-duplex highly spectrum efficient mode. As currently used all of the above modes require approximately 500 to 1000 Hz. of bandwidth per channel except packet which requires 2000 Hz. per channel. Effective use of that bandwidth in terms of character throughput varies considerably as a function of the protocol used and the channel conditions. Partly because of the requirement for 2000 Hz. of space per channel and partly because of the nature of the AX.25 protocol, the performance figures for packet are the poorest per unit of bandwidth of any of the currently used modes. RTTY and AMTOR are better, and PACTOR is better still. Clover promises to exceed the throughput per unit of bandwidth of any of the above modes.

Tolerance to poor channel conditions also varies among the modes with packet having the poorest performance, RTTY next, AMTOR and PACTOR being very much better.

A few respondents to the Survey expressed opposition to any form of unattended operation because of possible illegal use of amateur bands for unauthorized third-party traffic, commercial purposes, or the support of illegal activities such as drug smuggling.

The Committee is not aware of any pattern of such abuse nor does the Committee see any reason why illegal operation is not just as likely to occur directly between two attended stations as any other. The Committee did not consider this a factor in making its recommendations.

Competing Interests for HF Spectrum Space

The most difficult issue the Committee has had to deal with is the demand for spectrum space from the many different classes of users. Many of these users are sharing (somewhat unwillingly) the same space and each would like the others to vacate to other locations. The most critical frequency bands (at the moment!) are 20 and 40 meters.

On 20 meters the frequencies above 14,100 kHz. have been traditionally used for DX voice and below 14,100 kHz. for c.w. and data. With the advent of packet, and the STA authorizing unattended packet operation, packet operations began above 14,100 Hz. and has gradually occupied the region of 14,100 to 14,125 Hz. Due in large part to the fact that data is not allowed in this sub-band in some countries, packet operation has also extended downward into the band immediately below 14,100 attracting US operation in this sub-band as well. Non-US voice operators have taken exception to the use of the 14,100-14,125 space and RTTY operators have taken exception to the use of the space below 14,100.

On 40 meters packet operation began in the 7080-7100 Hz. region where traditionally RTTY and AMTOR operators had been active. This has forced the RTTY and AMTOR operations further down into the band in the region 7065-7080 to the dismay of c.w. operators. This picture is further complicated by the fact that outside of region 2 data operation must be confined below 7050 kHz.

The situation on other bands, especially below 21 mHz., though not as critical as on 20 and 40 meters, have similar conflicts. The informal 'sub-bands' used by the various modes are also somewhat fluid as propagation conditions change and usage shifts from one mode to another.

The Committee does not believe that any subdivision of the bands by rule will best serve the amateur community in the long run. It also seems unlikely that any subdivision of the band by mode will work on a world wide basis because of the differences

in the rules between regions and between individual administrations. Any subdivision of amateur bands by rule also imposes an unnecessary potential enforcement burden on the FCC.

Amateur Operating Practices and Traditions

Except in a very few special situations it has long been the tradition (and rule) that one amateur station must not willingly or knowingly interfere with a contact already in progress regardless of the mode of operation or the perceived importance of the communications in progress. It has also been a long standing tradition that no station or group of stations 'own' a frequency. (Frequency 'ownership' has admittedly become a practice on certain v.h.f. frequencies, but this practice has never been established on the h.f. bands and the Committee strongly rejects the concept of doing so now.)

On h.f. the use of sub-bands with various classes of operation gravitating to specific locations is largely self regulating

'60s.

Fully-Automatic Unattended Operation

The proposal to authorize fully-automatic unattended operation represents distinct departure from past practices. A clear majority of the respondents to the survey opposed any fully-automatic operation on the amateur h.f. bands.

To authorize fully-automatic operation without restriction, as some of the respondents to the survey advocate, would seriously undermine the fiber of mutual cooperation that h.f.

semi-automatic mode, thereby eliminating the need for a rule-mandated sub-band.

Semi-Automatic Unattended Operation

There are many reasons, however, why some form of automatic digital operation is desirable. It permits amateurs to exchange communications when there is a time difference between the operating times available to the two amateurs, and it permits the quick exchange of messages rather than taking air time with long calls and keyboard-to-keyboard operation. (This is not a suggestion by the Committee that keyboard-to-keyboard is undesirable but simply that there are many cases where moving messages at machine speeds is more spectrum efficient and makes more frequency time available to direct keyboard operation.)

It is very evident that some form of automatic operation is highly desirable when handling NTS and personal messages between amateurs through intermediate stations. This capability forms the very heart of the amateur community's preparedness for emergency service. Respondents to the survey favored semi-automatic unattended operation over those opposed by a two-to-one ratio.

The Committee does recognize that there is some potential for interference using a semi-automatic unattended mode even as there is such potential in purely manual modes. However, so long as there is a control operator present at one end of the link, monitoring the progress of an exchange, such interference can be held to a minimum. The benefits of semi-automatic operation outweigh the risk of inadvertent interference.

The Committee believes that in view of the long successful history of semi-automatic operation that authorizing unattended semi-automatic operation is in the best interests of the amateur community.

RECOMMENDATIONS

I. Unattended fully-automatic operation of amateur digital stations should not be authorized below 30 mHz.

II. The FCC rules should be amended to allow unattended semi-automatic operation of digital stations on any frequency on which digital modes are authorized. Unattended semi-automatic stations may not initiate a contact, either with another station or via an undirected broadcast. An operator initiating a contact with an unattended station must first ascertain that no interference will be caused to existing communications, and must monitor the progress of communications. If it becomes evident that the communications with an unattended semi-automatic station is interfering with other amateur communications then the link

with the semi-automatic station must be discontinued. An unattended semi-automatic station must be equipped with a time-out timer to insure that no signal is transmitted longer than five minutes in the event of the malfunction of control equipment or the loss of contact with the initiating station. Suggested wording for such an amendment is included in the appendix.

III. The FCC rules should be amended to allow the use of modem-dependent codes for the purpose of efficient data compression and error control on h.f. radio channels. The bandwidth of such signals should be restricted to 500 Hz. below 28 mHz. and 2000 Hz. between 28.0 and 28.3 mHz. The appendix to this report suggests specific wording for the recommended rule change. A station using a modem-dependent code must still comply with 97.119 Station Identification.

IV. The League should publish a comprehensive tutorial-style operator's guide for h.f. digital operations clearly defining acceptable operating practices. Such a manual would delineate currently used informal sub-bands for the various modes and styles of operation, and the good operating practices that are required for effective mutual cooperation and coexistence. This Committee will make specific recommendations for the content of this guide.

V. The League should publish technical standards or guidelines for the characteristics of signals generated by digital mode stations for the purpose of achieving the best possible use of the h.f. spectrum. QST should be used as a forum to educate that amateur community on the benefits and means of achieving acceptable signal quality and should review the technical characteristics of digital mode products with respect to published standards. This Committee will make specific recommendations for these technical standards.

APPENDIX A

The follow is suggested wording for an addition to Part 97 authorizing unattended semi-automatic digital mode operation.

97.3 Definitions

( ) Unattended Digital Station - A station in the amateur service using an RTTY or data emission that is operated without a control operator present.

97.216 Unattended Digital Station

(a) Any amateur station licensed to a holder of a General, Advanced or Amateur Extra Class operation license may be an unattended digital station.

(b) An unattended digital station may operate on any frequency below 30 mHz. that is authorized for RTTY or data emission for the class of operator license held.

(c) An unattended digital station may only use those RTTY or data emissions authorized by 97.305 and 97.307.

(d) No unattended digital station may initiate a contact with another station or may broadcast any undirected signal.

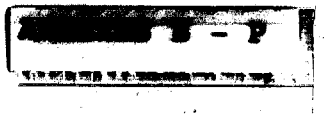
(e) The transmitter of an unattended digital station must be equipped with a time-out timer that will insure that no signal is transmitted for longer than five minutes in the event of the malfunction of control equipment or loss of contact with the initiating station.

(f) Any amateur operator initiating contact with an unattended digital station must first ascertain that no interference will be caused to existing communications, must be present for the duration of the contact, and must discontinue the contact if it becomes evident that communications with the unattended digital station is interfering with other amateur communications.

APPENDIX B

To encourage improvements in digital mode communications and especially to improved spectrum utilization on amateur h.f. bands Part 97, 97.307(f)(3) and 97.307(f)(4), should read as follows:

(3) A RTTY or data emission using a specified code listed in 97.309(a) of this Part may be transmitted. The symbol rate must not exceed 300 baud, and for frequency-shift keying, the frequency shift between mark and space must not exceed 300 Hz. A RTTY or data emission using an unspecified digital code under the limitations listed in 97.309(b) of the Part also may be



ANNEX B

April 5, 1993

Mr. Warren Sinsheimer, W2NRE
American Digital Radio Society
30 Rockefeller Plaza
New York, NY., 10112

Dear OM:

[redacted]

ANNEX C

5 April 1993

David Sumner K1ZZ
c/o ARRL
225 Main St
Newington, CT 06111

Dear Mr. Sumner

This is to inform you that the recent actions of the ARRL not to include semi-automatic operation outside of the automatic subbands has left me a bit upset.

As a laborer, I work hard for my money, and will not support those organizations (or politicians) which do not represent my best interests.

Thank you for your time.

Sincerely,

Richard C. Kulaga KE7XO/V85XO
4741 Brushfire
North Las Vegas, NV 89031-0111
702-645-4269
702-496-4147

Copy:
Warren J. Sinsheimer W2NRE
bud Thompson N0IA
Joe Lambert W8IXD
Charles P. McConnell W6DPD
Brad Wyatt K6WR

ANNEX D

Wewahitchka, Florida
April 4, 1993

Mr. Frank Butler, W4RH
323 Elliott Road
Ft. Walton Beach, FL 32548

Dear Frank:

Greetings and best wishes.

I am writing regarding the possible loss of our HF digital APlink, unattended HF Mail Boxes, BBS's etc. I have been very active in the digital modes for well over a year and can't imagine what is in the process of happening. The omission of one of the most important paragraphs of the ARRL Digital Committee's recommendations was neglected. I strongly object to what is happening in the Proposed Rule Making.

Frank, you have been very active in all phases of the amateur service for as long as I have been a Ham and plead that you will assist us in correcting matter.

Thanking you in advance for your continued support, I remain your friend and supporter.

Sincerely,

Nils A. Millergren, WA4NDA

Copy

ANNEX E

7808 R C Gorman N.E.
Albuquerque, NM 87122
2 April, 1993

Marshall Quiat, AG0X
Rocky Mountain Division Director
1580 Lincoln St., Suite 440
Denver, CO 80203

Dear Sir:

I am writing to express my concern regarding the ARRL Board of Directors' failure to fully accept the recommendations of the Digital Committee concerning the band plan for HF digital operations. Specifically, I was very disappointed that semi-automatic mailbox, or bulletin board station, operation outside the proposed automatic digital subbands (ADS) was not specified.

If communications between operator controlled and semi-automatic digital systems are required to occur only within the narrow confines of the ADS, the results will be catastrophic. The overcrowding of rapidly developing digital modes will mean extreme levels interference and low levels of functionality for all involved.

I am convinced that the potential for traffic handling, amateur radio's backbone, is greater than ever if the band architecture is properly managed. As an avid user of the digital modes and an active traffic handler, I depend heavily on access to the HF "APLINK" semi-automatic, as well as automatic, mailbox systems. If all these systems are squeezed into a 5 KHZ band segment along with existing and future automatic systems, rather than being permitted to scan the entire authorized RTTY allocation, digital HF traffic handling will be severely hamstrung.

Please communicate to the Board the need to specify that semi-automatic operation be continued to operate within all presently authorized digital segments of the HF bands and not be limited to the ADS.

Thank you.

Sincerely,

Bruce Batson, N7AHI

cc DAVID SUMMER, K1ZZ
WARREN FANSWORTH, W2NRE

Jim C. Nissen, KG6NL
121 Lake Shore Dr., POB 504
ALLYN, WA 98524-0504

ANNEX F

Mr. David Summer, K1ZZ
ARRL Headquarters
225 Main Street
Newington, CT 06111

Reference: Pending decision on HF Auto Digital Subbands.

I appreciate the decision to delay change pending your July meeting. This issue is of special concern to me.

My station location precludes regular use of VHF bulletin boards. I rely on APLINK mailbox operations via AMTOR to communicate with friends in California, Utah, Nevada and Arizona. Thus, I am a keyboard operator.

Allow me please to make five points. First, the use of digital communications is growing very rapidly. It is estimated there will soon be 200,000 digital controllers in use. All will be drawn to the HF Mailbox operations.

The bulletin boards and mailboxes are continuously auto-forwarding to each other under computer to computer control as they pass traffic (personal messages as well as NTS communications; typically 12 to 18,000 per station per month).

Under the proposal, semi-automatic mailbox or bulletin board operation would be confined to very restricted 'automatic digital' sub-bands. They would not be allowed to scan a broader band for contact by keyboarders. They would be restricted to narrow segments (i.e. only 5 KHz on 40 Meters).

The result would obviously deny use of those segments to the keyboard operators. The bands will be loaded to capacity. Hams like me will simply loose a mode of communication. Even now, we frequently must check and re-check a particular HF Mailbox because the frequency is in use. By spreading the semi-automatic operations around the bands, as it is now, both keyboard and auto forwarding will be more efficient.

I must protest against the proposed change. Please council with the Digital Committee further on this issue. They are known to have years of amateur and commercial experience and are experts on this subject.

Respectfully,

Distribution, please see next page.